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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,660	11/20/2001	Mark Myers	017750-507	9021

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EXAMINER	
LEE, SHUN K	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/988,660	MYERS ET AL.	
	Examiner	Art Unit	
	Shun Lee	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2001 & 20 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *0202* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

(a) "20/1000th", "60/1000th", and "40/1000th" in paragraph 0019 lack units; and

(b) "detector 222" in paragraph 0022 should probably be --detector 208--.

Appropriate correction is required.

Claim Objections

2. The numbering of claims is not accordance with 37 CFR 1.75 (*i.e.*, if there are several claims, they shall be numbered consecutively in Arabic numerals). Misnumbered claims 13-21 have been renumbered as 12-20, respectively.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitations "red MWIR band" and "blue MWIR band" and claim 8 recites the limitation "indigo LWIR band" which is vague and indefinite since the specification fails to define the wavelength ranges of the "red MWIR band", the "blue MWIR band", and the"indigo LWIR band".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-4, 9-13, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howard *et al.* (US 4,507,551) in view of Applicant's Admitted Prior Art, Amos (US 5,369,511), and Ben-Menachem *et al.* (US 2001/0029816).

In regard to claim **1-4**, **9-13**, and **15-20**, Howard *et al.* disclose (Fig.) an infrared imaging apparatus, comprising:

(a) a dewar (10), having an internal volume that defines a cold space;

(b) an IR transmissive window (28) that seals the cold space to receive IR energy directly from an IR source;

(c) a first lens (12) located within the cold space to receive IR energy directly from the IR transmissive window (28), wherein the single lens (12) is made of germanium (column 2, lines 63-68);

(d) an IR detector (14) located within the cold space in operational communication with the first lens (12); and

(e) an optical stop (16) located within the cold space in front of the single lens (12).

While Howard *et al.* also disclose (column 2, line 9 to column 3, line 30) using well known techniques of lens system design in order to obtain a desired field of view, the apparatus of Howard *et al.* lacks an explicit description of performing at an F-stop (F/#) of at least 1.4 with a square field of view of 90X90 degrees and that the single lens (12) is made of silicon and has a first aspheric profile (*e.g.*, radius=-0.94467, k=28.345216; a=-2.13952, b=-69.5274, c=2342.04, d=-56841.9, and first surface thickness=0.548467 or radius=-1.23508; k=36.049455; a=-1.69104; b=-98.6413; c=5589.83; d=-162359; and first surface thickness=0.761661) on a first side and on a second side facing the detector and parallel to the first side, a second aspheric profile (*e.g.*, radius=-0.61281; k=0.1399; a=0.033459; b=-2.3598; c=10.889; d=-36.331; and second surface thickness=0.462731 or radius=-0.81270; k=-0.10748; a=0.054475; b=-0.72423; c=2.9155; d=-7.8939; and second surface thickness=0.480234) having a holographic optical element (*e.g.*, -0.0051393, -0.10212, 0.91035, -2.3946 or -0.017112, -0.038991, 0.55069, -1.6405) for color correcting at least one color band (*e.g.*, a MWIR band and a LWIR band) of infrared energy such that a focal plane of at least a first IR energy wavelength and second IR energy wavelength (which is a harmonic component of the

first wavelength) is at a position coincident (i.e., common focal plane) to the IR detector (14). However, techniques of lens system design comprising the use of aspheric surfaces with or without incorporation of diffractive elements are well known in the art. For example, Applicant admits (paragraph 0028) that aspheric lens design using commercially available software is well known in the art. As another example, Amos teaches (column 18, line 43 to column 19, line 9) that diffractive elements allow for the correction of optical aberrations. As still another example, Ben-Menachem *et al.* teach (paragraphs 0002, 0003, and 0075) aspheric surfaces with or without incorporation of diffractive elements for infrared lens (e.g., silicon lens for the infrared wavelength regions) allow for the correction of optical aberrations. Therefore it would have been obvious to one having ordinary skill in the art to provide a silicon lens having aspheric profiles and holographic optical element in the apparatus of Howard *et al.*, in order to correct for optical aberrations so as to obtain a desired field of view (*e.g.*, a square field of view of 90X90 degrees with an F-stop (F/#) of at least 1.4).

8. Claims 6, 7, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howard *et al.* (US 4,507,551) in view of Applicant's Admitted Prior Art, Amos (US 5,369,511), and Ben-Menachem *et al.* (US 2001/0029816) as applied to claim 1 above, and further in view of Tennant *et al.* (US 6,034,407).

In regard to claims **6**, **7**, and **14**, which are dependent on claim 1, the apparatus of Howard *et al.* lacks that the detector is a hyperspectral detector which detects at least three wavelengths of IR energy including at least one LWIR band of energy and concurrently collects radiation from multiple, adjacent spectral radiation bands.

However, hyperspectral detectors are well known in the art. For example, Tennant *et al.* teach (column 1, lines 17-36, column 2, lines 13-36) that a hyperspectral detector offers concurrent collection of multiple, adjacent spectral infrared radiation bands. Therefore it would have been obvious to one having ordinary skill in the art to provide a hyperspectral detector in the apparatus of Howard *et al.*, in order to detect multiple, adjacent spectral radiation bands (*e.g.*, at least three wavelengths of IR energy including at least one LWIR band of energy).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703) 308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

CONSTANTINE HANNAHER
PRIMARY EXAMINER
GROUP ART UNIT 2878

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September 29, 2003